Computer Engineering Department
Faculty of Engineering, Mahidol University

LAB07: Morphological Image Processing

Objectives

Upon completion of this lab, you will be able to:

1. Understand the concept of morphological image processing.
2. Write a user-defined function in MATLAB to performs the morphological image processing on the grayscale image, including dilation, erosion, opening, and closing.

Exercises

Note that you should create your own function in MATLAB as MATLAB User-defined function. It means that you cannot call MATLAB built-in function, which generates output in the same manner as your own function. You can use the images provided in the folder **\Google Drive\EGCI486-Image Processing\Second(2015-2016)\LABs\LAB07** for your exercises.

1) Morphological image processing using dilation

1.1 Write the user-defined function in MATLAB to perform morphological image processing on the input image using dilation with a 3×3 structuring element. The structuring element (SE) is [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Mydilate.m. When this program is used with the image "wirebond-mask.tif" result as shown in Figure 1.

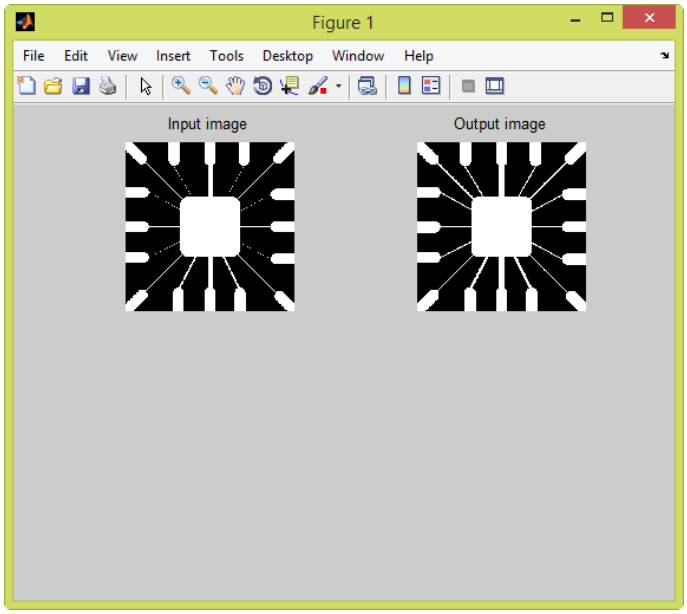

Figure 1: The result image of applying the morphological image processing on the input image by using dilation.

2) Morphological image processing using erosion

2.1 Write the user-defined function in MATLAB to perform morphological image processing on the input image using erosion with the 3×3 structuring element, having [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Myerosion.m. When this program is used with the image "wirebond-mask.tif" result as shown in Figure 2.

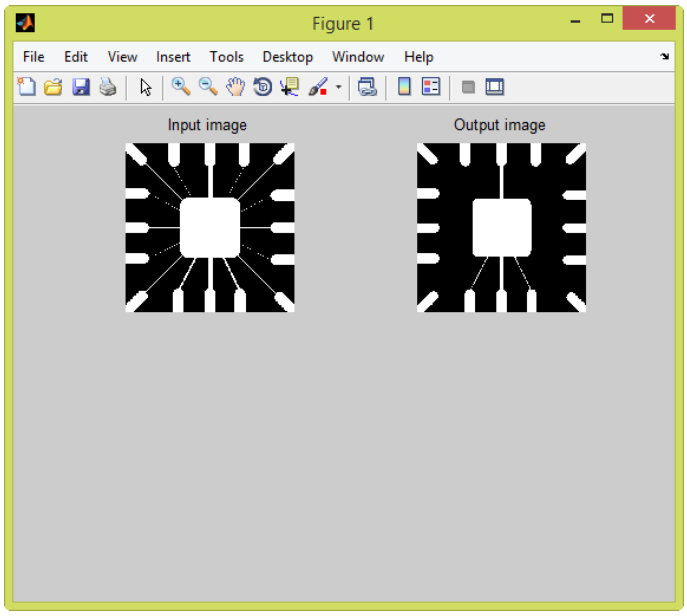

Figure 2: The result image of applying the morphological image processing on the input image by using erosion.

3) Morphological image processing using opening

3.1 Write a program in MATLAB to perform morphological image processing on the input image using opening with the 3×3 structuring element, having [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Myopening.m. When this program is used with the image "noisy_fingerprint.tif" result as shown in Figure 3.

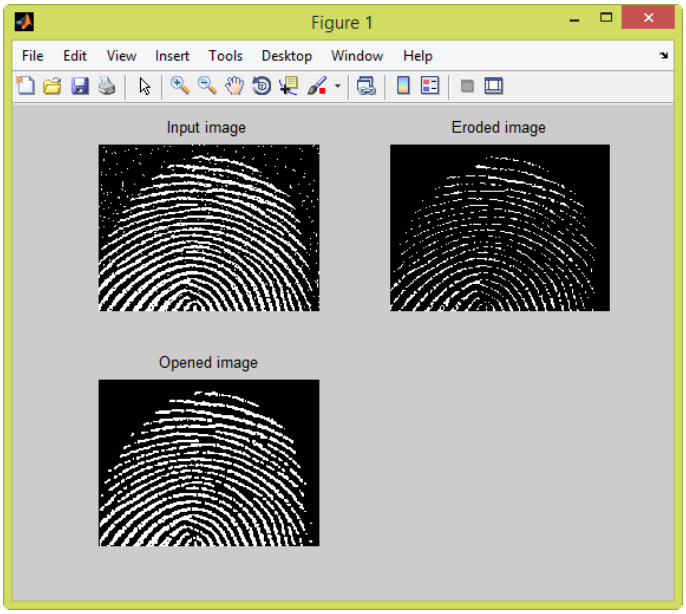

Figure 3: The result image of applying the morphological image processing on the input image by using opening.

4) Morphological image processing using closing

4.1 Write the program in MATLAB to perform morphological image processing on the input image using closing with the 3×3 structuring element, having [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Myclosing.m. When this program is used with the image "noisy_fingerprint.tif" result as shown in Figure 4.

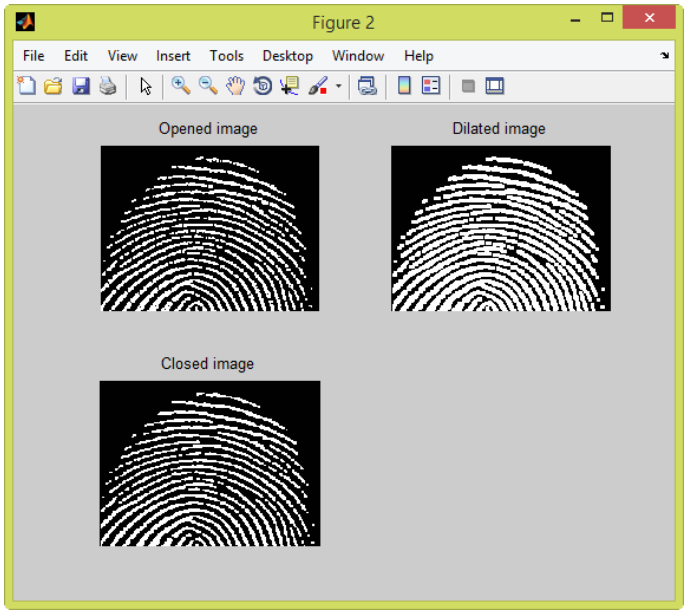

Figure 4: The result image of applying the morphological image processing on the input image by using closing.